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ANIMAL KINGDOM

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ANIMAL KINGDOM

Bulletin of the New York Zoological Society

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Trusteeship for Animals

A YEAR COMES TOWARD ITS END — another year. Man will make the turning of the year an occasion for review of the one just past and making plans for the new year about to be born. Our lives are measured by months, by weeks and by days — minutes, too, must be accounted for — occasionally even by insistent flashing signs atop high buildings in great cities. Man alone has the capacity to look back into the past and to peer into the future.

Animals are incapable of using time as a yardstick for planning in this way, although despite this they have evolved and flourished over millennia of time. The pattern of their lives is expressed in a poem from the Sanskrit:

"Look to this Day!
"For it is Life, the very Life of Life."

Consequently, all animal life on this earth, indeed all natural living things, are at the mercy of the planner, the builder and destroyer — man himself. The great hope is that within his plans and visions for the future, man will make sure to be the guardian of the natural world around him. If he fails to do this, the richness of the earth will eventually disappear and man might as well move to the moon or some other sterile planet.

Fairfield Osborn

THE COVER PICTURE

This magnificent Reindeer buck came to the collection in February, 1957, as a young adult animal, and its antlers have been increasing in size each year. Now they are nearly at their peak. This photograph was taken late this fall while the animal was losing its velvet, shreds of which are still clinging to the hardening antlers.

Three of Them!

WHITE WHALES FOR THE AQUARIUM

By CARLETON RAY

Associate Curator, New York Aquarium

Photographs by W. ROBERT MOORE

National Geographic Magazine

AT THE NORTHEASTERN ROOT of the Alaska Peninsula, the Kvichak River flows into Kvichak Bay, which in turn merges with the vast expanse of Bristol Bay. At the mouth of the Kvichak there is a jumble of geography with such names as Dead Man's Flats, Copenhagen Creek and Half Moon Bay, and there, at certain seasons, the white whales known as belugas come to feed in the muddy shallows. They are vulnerable to capture when they are in the shallows on a falling tide and that is why the New York Aquarium sent an expedition to Alaska this August. We wanted white whales for our Oceanic Tank. We got them, too; three of them.

"Beluga" is a Russian word meaning "whitish" and it is apt, for adults are ivory white over the whole body except for brown eyes and grayish edges to the fins. Bulls may be 16 feet long, cows a foot or two shorter. Calves are born in the spring or early summer and are 5 to 6 feet long, dark gray in color; they become progressively lighter and are white by the time they are 10 to 12 feet long. Scientifically, belugas are called *Delphinapterus leucas* and their nearest relative is the "unicorn of the sea," the Narwhal, *Monodon monocerus*.

The expedition left New York by air on August 5: Charlie Young, senior tankman of the Aquarium; W. Robert Moore, chief of the foreign editorial staff of the *National Geographic Magazine* (who was to cover the capture in still photog-

raphy) and myself. The next day Seward Johnson, a Life Member of the Zoological Society, joined us in Anchorage. His job was to take motion pictures. (The Zoological Society will see them at the mid-winter Members' Meeting).

On a trip such as this you try to think of everything you need and take it with you, for while a great many articles can be purchased in Alaska as readily as in New York . . . still, the articles likely to be required for the capture, care and transportation of white whales are not stocked everywhere. We took four thick, foam-rubber mattresses, foam-rubber pillows, waterproof covers for them, a 40 H.P. outboard motor, oversized, reinforced hospital stretchers, 25 yards of cotton muslin to cover the whales and keep them wet when they were out of water – and a more usual miscellany including antibiotics and vitamins, camp stove, sleeping bags and food.

For some days prior to our departure a series of telephone calls had been made between New York and Alaska and we were in close contact with James Brooks of the Alaska Department of Fish and Game. His department approved of our venture and with typical and unfailing Alaskan cooperativeness had undertaken to find Charlie Wilson for us – Charlie Wilson, a fast man in a motorboat and an expert herder of white whales. He is the best small boatman I ever saw. He can stand in the stern of a small skiff going full speed and turn on a dime, almost never losing track of a tricky whale, and then throw a 300-foot salmon net around the animal. All at full speed.

White whales really are white! However, the three in the Aquarium are not quite as white, yet, as this one appears to be. Still "off-white," they will attain a more clear whiteness two to three years hence.

On the morning of August 9 we all met at Naknek on the shore of Kvichak Bay – the four of us from the east, Charlie Wilson and Alex Tallekpalek, the latter with his 22-foot skiff that would come in handy for transporting whales rounded up by Charlie's faster 16-foot skiff. We crossed the Kvichak in Charlie's 32-foot salmon boat, the *Ann*. It was a pleasant day on the Kvichak. Jaegers and terns and gulls soared in a sky that was at least a third blue, into a ten-mile wind, and a light rain that fell from the spotty cumulus cover. By mid-afternoon we pulled into Copenhagen Creek and began to unload gear. Charlie Young sank into mud to his knees, Seward Johnson almost disappeared from sight, and Bob Moore had to be unstuck a couple of times. It was not our last encounter with Alaskan mud before the expedition was over.

The cabin on the tidal flats that was to be our home for an indefinite number of days was in pretty good shape; there was rot in the corner that hung over a bank that the tide had washed away a few years ago. But the 1958 tarpaulin was still on the roof.

We settled in and studied the tide tables. Belugas are governed largely by the tides, ascending the river in the deeper channels on the flow and feeding in the creeks and the river itself as they travel. On the ebb they usually follow closer to shore downstream, still feeding or just travelling leisurely. The ebb is the time to catch them, for it is then that they are more likely to be near the flats where they can be driven into shallow water and netted.

At about half-ebb, the belugas are usually in the vicinity of Half Moon Bay, where the flats are a couple of miles wide with water scarcely changing in depths over wide expanses. At low tide they are 15 miles south on Dead Man's Flats. At Copenhagen Creek the tide varies from 13 to 25 or more feet and flows in the channels at 6 to 10 miles an hour. Beluga-hunting is, therefore, a pre-determined affair, depending on the tides.

And there is one other compelling factor: the wind. We could hunt in cold and rain, clear skies or cloudy, but not in wind. A chop of less than six inches makes it impossible to follow a whale's wake in this murky water.

The next few days were discouraging. There were few whales in the river, a dozen or two at most, and the wind rose with the sun and tide. But we did try. A typical experience was chasing a 9-foot whale one morning in only four feet of water. Usually, by keeping on the deepwater side of the animal and revving the motor occasionally, you can turn it into the shallows – into 4-foot depths, or 3-foot, or even less. As the whale rushes for deeper water you keep the motorboat outside and ahead of it. On this particular morning we had perfect calm and the wake of the

The real start of the expedition came when the "Ann" was unloaded on the mud flats a couple of hundred yards from the cabin.

The expedition's camp was at this cabin on Copenhagen Creek. Dr. Ray can be seen on the roof, attempting to spot whales through binoculars. The tide comes to the grassy flats.

Left — Seward Johnson and Alex Tallekpalek got stuck in the mud while handling the boat. Below — Skiffs were stranded by the tide, for it rises or falls up to a foot every 18 minutes.

whale was easily followed, but for some reason it would not enter less than four or five feet of water. Finally, showing no particular fear, it reversed itself with typical beluga maneuverability, left us stalled, dived under the skiff, and simply disappeared.

Then came a gray and dreary day with an 8-10-mile northeast wind – a good beluga day, nevertheless. Alex woke at 4 a.m. and danced a jig around the cabin, chanting "We'll catch one today!" At Dead Man's Flats at 9 a.m. not a whale was to be seen, but at Half Moon Bay on the way back we spotted a small group. A gray whale was in the midst of it – just the size of youngster we wanted.

It took Charlie Wilson half an hour to ease the animal into three feet of water and to position himself for the throw of the net. The net went out smoothly and almost immediately the whale rolled into it. Quickly and as gently as possible we noosed it, despite its objections; it threw me more than once and drenched Charlie Young when he jumped into the water, clothes and all, to help. The larger skiff was brought up with mattresses arranged on its bottom, we slipped a board under the whale, lifted, and slid the animal into the skiff. In half an hour it had calmed down almost completely and by that time we were back on the beach in front of the freshwater holding pond where our captives would be kept until we had three or four and were ready to leave.

This was a beautiful animal, a female 9 feet 4 inches in length, about 800 pounds and just turning white on the "melon," the raised bump on the snout. Unfortunately when we reached the beach it was almost dead low tide and there were 300 yards of sand and mud, all uphill, between us and the pond. We dared not wait for the tide to turn and float the whale part of the way. So Charlie Wilson and Alex improvised a sled and padded it with a foam mattress. The whale was lugged onto this and covered with wet muslin and by pulling, all of us, with all our strength, we dragged that whale to the pond. A gain of 25 to 50 feet was all we could register at a time, and it took an exhausting hour, but we made it. Afterwards we collapsed on the tundra.

Now the critical phase of the expedition had begun. As long as "Charlie" (as we had nicknamed her) remained in the freshwater pond, she would necessarily have to go without food, and would become weaker. We had to catch a couple more quickly, for we did not want to go home with only one. Belugas are sociable animals and three are far more than three times as safe as one.

For the next seven days we didn't have a chance. The weather was "wind with occasional calm," and the wind varied from 10 to 40 miles an hour. The Kvichak was impossibly rough but "Charlie" was doing well in the pond.

Sunday, August 20, was a day of reprovisioning. Seward and I flew to King Salmon and a surprise awaited us at the airport; the B-17 plane from New York that was going to carry our captures home was waiting for us, despite an earlier telegram asking it to wait until we had caught our whales! But on second thought, the situation wasn't too bad. True, we had only one whale, but we had the B-17 crew of four as extra helpers if we needed them.

That night I queried Charlie Wilson.

"Where do you think they are, Charlie? Maybe following the salmon in Nushagak Bay, on the other side? How about chartering Guy Groat's plane and scouting them out?"

"I guess we could" was as far as Charlie would go, so we walked down to the *Ann* and got Guy on the radio.

Next day we flew the bays. There were only a dozen whales in Kvichak and perhaps twice that many in Nushagak. Not good at all, and still the wind. If whales were seals, we would have been in good shape, though. There were several hundred on the east bank of the Nushagak.

Tuesday: wind and rain. Wednesday: a wind shift to the north, a blue-black sky at night and a brilliant moon. At 11:20 o'clock on Thursday morning we saw a big school heading past the creek downstream.

"Fifteen minutes, then let's go," I said, gulping the noonday soup.

Then Charlie made a deal. "Give me the kicker if we catch two today?" he said.

It didn't take me long to agree to what I thought was an impossibility – to capture two whales in one day. The outboard motor would be a cheap price to pay for such luck.

"It's a bet."

We tore out of the creek for Half Moon Bay and just beyond the creek Charlie spotted a wary "floater," a gray two-year-old. He followed it to the north end of the bay and quickly eased it into three feet of water. The net ran out and the whale was inside. Just then Guy Groat's float plane loomed up carrying Karl Keller of the B-17 crew – welcome aid in the job of dragging our capture to the holding pond. It was a fat, 9-foot 2-inch female, about 800 pounds, nicknamed "Bertha III" for identification. Although the tide was only two-thirds out and our haul up the beach was only 200 yards, and we had a total of eight men to help, I still wonder how we did it in an hour the first time.

Such a lucky quick capture took the edge off our desire for another battle, but Guy brought word that there were still whales in the bay. He offered to spot them for us with his plane. Alaskans have a hard time not being helpful.

The adrenalin flowed again, plane and skiffs headed south. Guy flew 15 miles to Dead Man's Flats and circled tightly. Then it happened.

Before our eyes the big school appeared. The late afternoon sun reflected on sky and water to blend them into luminescent blue-gray at the horizon. Against this shimmering backdrop, as if suspended in space, appeared the gleaming white backs and puffy spouts of the belugas. There could have been a hundred in the whole herd. In no time, it seemed, we were at Dead Man's Flats and had overtaken a 12-foot cow and her yearling calf.

They were a close pair, refusing to separate yet making only a few furtive attempts to escape into deeper water. The sea was glassy and following their combined wakes was no problem. They soon were in two and a half feet of water, swimming at the same slow speed and breaching at the same instant. There was nothing to do but throw the net around them both.

The cow immediately hit the net and dragged a fifty-foot pocket with her. I leaped into the water and went for her. Making my grab for her tail with the noose, she slapped me on the head and shoulder and left side with a pair of flukes almost three feet across. The blow threw me backward into the water.

Charlie Wilson and Charlie Young were in the skiff, drawing the ends of the net together,

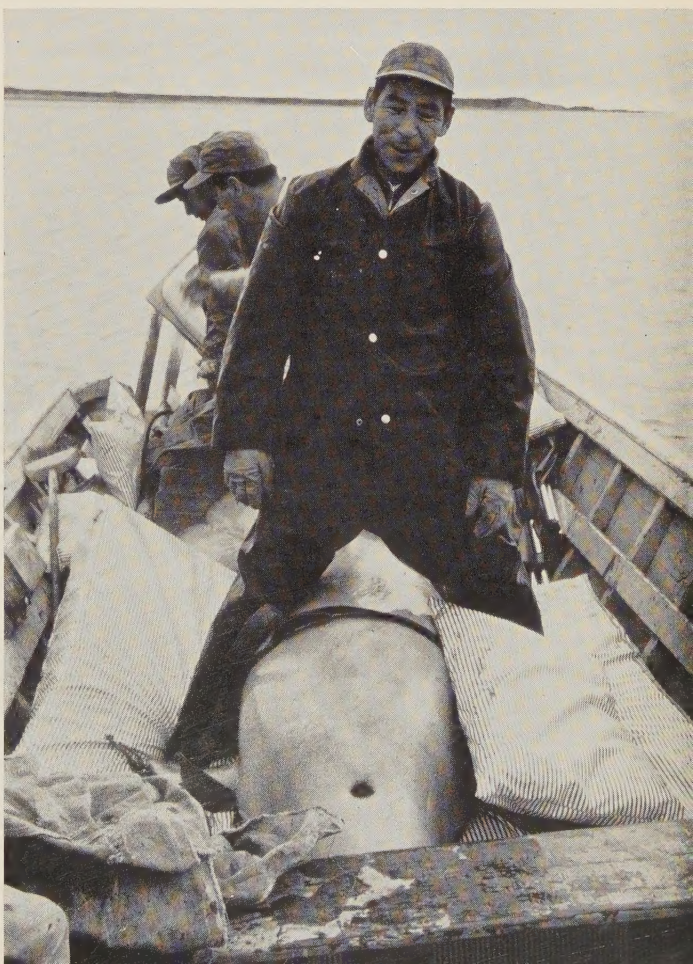
Top — Chasing a whale, seen at the left of the boat. The 300-ft. salmon net will soon be cast out. Center — Now comes the job of getting the whale out of the net. Its mother has drawn out a pocket in the net, upward and to the right. Bottom — Dr. Ray has a strap around the whale's tail and holds it in the shallow water.

Above — Wet muslin is spread over the whale on the way to the holding pond. It rests on foam-rubber mattresses. Right — Charlie Wilson was proud of the whale named "Charlie."

and I abandoned the cow and went for the calf. At first its sonar functioned perfectly and it always avoided the net, approaching within six feet and then turning sharply. But as I pressed it closely it hit the webbing and rolled. We had it. It was a male, 7 feet 3 inches long, about 450 pounds and very fat, active and vocal.

With comparative ease we hoisted it into Alex's skiff where it began to make an amazing variety of noises — flatulent puffs, creaky to mellow whistles, high squeaks and squeals. We named it "Alex."

There was still the problem of the big cow, who must have weighed 1,600 pounds. We knew it was hopeless to try to carry her, but we had to make the attempt. We noosed her and made two futile attempts to hoist her into the skiff, but in the end we had to give up. We released her and she swam off in 18 inches of water. It was just as well. The tide was going out and we



Above — Attempting to load a 1,600-lb. female beluga. The method is to slide it on a board, then try to lift the board while pulling on the straps. This board broke and the whale was liberated. Below — an improvised sled was used to haul "Charlie" some 300 yards from the water's edge to the holding pond. The animal weighed 800 pounds and it was a hard chore.

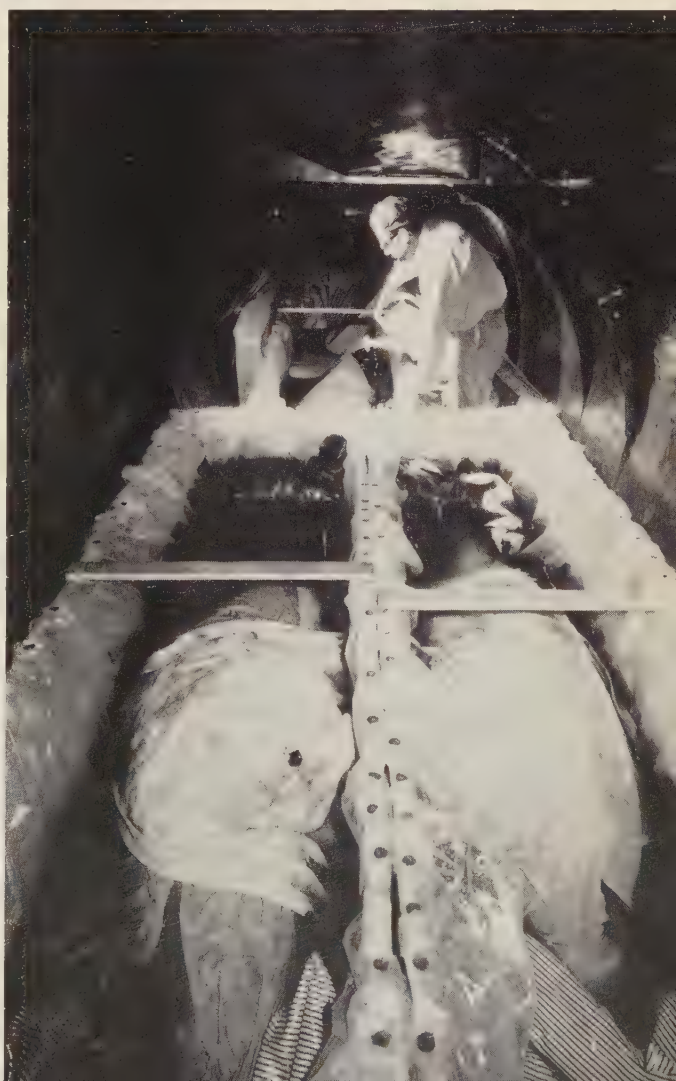
Above — Loading "Alex" was tricky, for the weather turned bad and the boards broke. Right — But everything came out all right. All three whales are in the B-17, ready to depart.

scraped bottom on Dead Man's Flats several times on the way home. By 5 o'clock that evening all three belugas were swimming close together, counter-clockwise, in the holding pond.

We would have liked to have four whales and we made another attempt the next day without success. Well, three would crowd the B-17 anyway.

Saturday, August 26, was loading time, prefaced by the recapture in the pond. It was a matter — and not an easy or quick one — of seining for them, strapping them, laying them on their stretchers, and then sledding them to a spot on the beach where we thought the *Ann* would be at half tide. On the beach they were laid on mattresses and covered with wet muslin while Charlie Wilson brought the *Ann* closer with the tide.

Loading was a nightmare. A 2-by-12 plank cracked under the weight of loading little "Alex" onto the *Ann* and we knew we could never lift the 800-pounders up five feet while standing in



the mud. There was only one thing to do; load the two heavy females into Alex's skiff one at a time and then transload into the *Ann* across a slightly inclined plank bridge.

If we ever do it again, I shall call on the entire population of King Salmon to help. Maneuvering the boats left only four of us to lift those whales. We did it in an hour and a half, and I still don't really know how.

Under deteriorating weather we rode a rising sea to King Salmon and its large airfield. I do believe the entire town was waiting. As usual, the Alaska Department of Fish and Game pitched in, one and all. Dean Paddock and Frank Lockard had their truck lined up to carry the whales to the airfield and the local people helped so that the unloading was only a fifteen-minute task. Charlie Wilson and Alex pulled out as soon as the whales were transferred.

"I'll have the motor ready for the next time," Charlie told me, grinning. That night they would be back in Copenhagen Creek and the day after in Levelock preparing for the fall and winter hunting and trapping.

Aboard the plane the whales' boxes were filled with water to immerse half to two-thirds of their bodies, so that only part of their weight pressed down. At 4:30 we were off, 24 hours' flying time from New York.

At 1 a.m. on August 28 the three whales were swimming in the Aquarium's Oceanic Tank.

* * *

That is the story, except to say that we have gotten over the highest hurdle, that of getting the whales to eat. They did not do so for the first week, despite chewing incessantly on all the fish that were offered to them. Then we administered heavy doses of crude liver extract, rich in vitamins, and the next day they all fed heavily. They were not, of course, in the seclusion that would have been best for them. They had to become accustomed to clear water, to glass walls, to the noise of people and aircraft and, worst of all, to the construction still going on in the filter next to their tank. The noise visibly frightened them. But they came through admirably and two months after arrival began taking frozen killifish from the hand. They each consume more than 30 pounds of killifish a day plus large vitamin doses and we are confident that they will soon accept the more nourishing mackerel which we offer to them. Then we will begin training them in a show that will be a bit different from that of the usual oceanarium: a demonstration of their remarkable sonar ability. Along with it will go a program of research, for these are in many ways the most remarkable of the smaller cetaceans and there are many things to be learned.

Three-inch-long killifish are staples of the whales' diet in the Aquarium, but we hope to get them onto large food soon.

HOW OLD ARE THEY AND HOW BIG DO THEY GROW?

By HERNDON G. DOWLING

Curator of Reptiles

Probably the commonest questions about reptiles that we hear in the Bronx Zoo's Reptile House are: "Are they alive?", "How old are they?" and "How big do they grow?" Unfortunately these latter two are extremely difficult questions to answer — with accuracy — and the questioner too often has to go away with his curiosity unsatisfied.

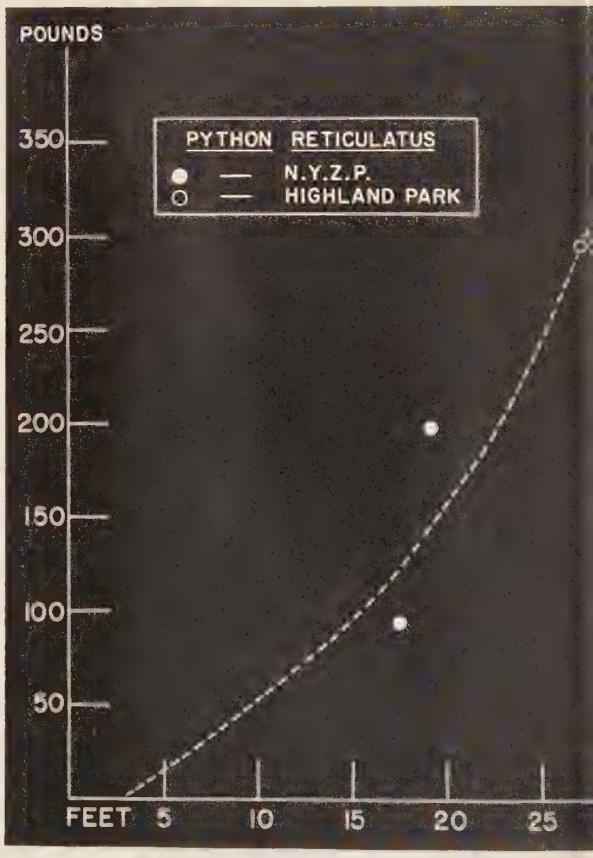
While our inability to answer such apparently simple questions about reptiles may seem strange to the uninitiated, a little background shows the reason for it. First, in regard to age: reptiles do not display the symptoms of age that we look for in mammals; they do not get flabby, wrinkled or obviously infirm. Though their growth slows down in later life, it apparently never ceases completely. Thus it takes a complete history of the animal from birth for us to know about its age. A few field studies have been made in the United States and elsewhere that give some information about the life span of some of the smaller and shorter-lived lizards and snakes, but none has yet been made of any of the longer-lived kinds. Under captive conditions, too, this information is difficult to obtain. Unless the animal was born here at the Zoological Park or arrived here at an obviously early age, we can seldom give even an approximate life span.

In earlier days when ideas on rates of growth in reptiles was based on information from the poorly equipped and poorly heated reptile houses of that time, it was believed that all growth was very slow and thus that any large reptile must be extremely ancient. More recent studies have shown this to be completely untrue. An alligator may be mature in eight years and a giant tortoise may weigh over a hundred pounds in less than this time — if given proper conditions. Even so, information on maturity and early growth rates is still a long way from maximum ages and maximum sizes and we still have almost no information on these latter items.

This information is particularly difficult to obtain on the giant snakes. Tropical in distribution and long-lived in captivity, they still lack the field studies that might give us some idea of growth in nature. Probably such studies will never be made, because of the difficulties of capturing, marking, measuring and recapturing such animals. As a secondary choice, then, we must turn to studies of their growth under captive conditions. We hope that the growth rates under good zoo conditions are similar to those in nature; already field studies have corroborated such observations on crocodilians and we believe that our giant snakes are kept even more nearly under natural conditions.

Giant snakes have been kept in zoological parks for many decades and it seems strange that the information on growth is still so scanty. However, the difficulties of obtaining accurate lengths and weights, added to the difficulties of keeping accurate records, are a partial answer. No one who has attempted to obtain an accurate measurement of a large snake will underrate the difficulties involved! Probably, too, many records are hidden among the notes of curators and reptile keepers. It seldom seems necessary to publish such information until a great deal of it has accumulated — and accumulation is exceedingly slow.

However, two recent papers on growth in giant

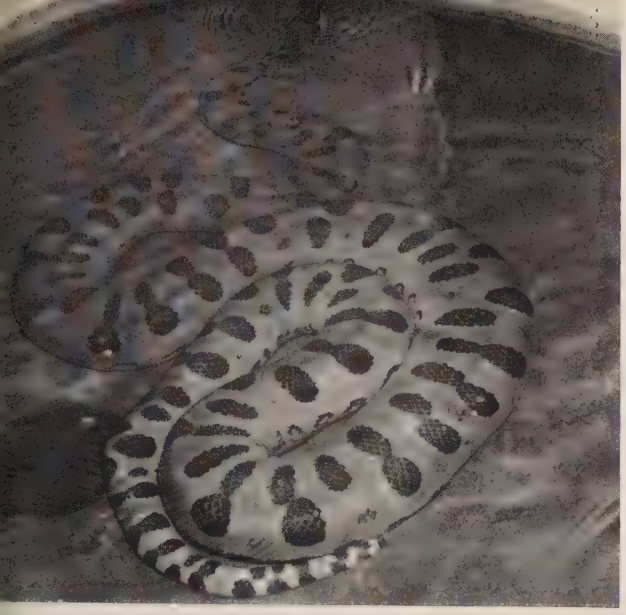


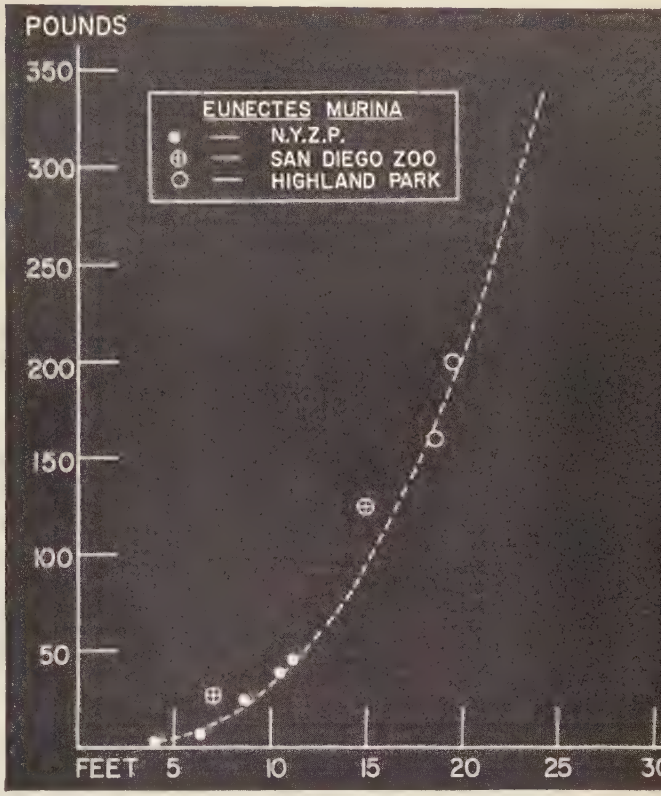
Above — The Reticulated Python named "Colossus," in the Pittsburgh Zoo, may be 30 ft. long and is probably the largest in any zoo. Right — The graph indicates that a 30-ft. snake weighs about 350 lbs.

Photo by William B. Allen, Jr., Pittsburgh Zoo

snakes have stimulated this one. Perhaps it, in turn, will stimulate others. One of the papers contained more or less casual observations by Jerry H. Staedeli on the growth of an Anaconda at the San Diego Zoo (*Zoonooz,* 34 (10)) while the other was a study of the growth of several giant snakes at the Highland Park Zoo in Pittsburgh (Barton & Allen, *Zoologica,* 46 (7)). When combined with some of our own information on growth here at the Zoological Park, it is possible to present a somewhat better picture of the growth of several of the giant snakes than has previously appeared.

The recurrent question of which species of snake grows to the greatest length is still not settled, although the question has by now boiled down to whether it is the Anaconda of South America or the Reticulated Python of southeastern Asia. Without any question, however, Reticulated Pythons (*Python reticulatus*) have always held the prize among snakes that have been brought back to civilization. Although the oft-quoted 32- or 33-foot length appears to be based on an individual killed in the jungles of the





Left — The Anaconda in our collection is 11 ft. long — not a very large snake. Right — We lack data about Anacondas over 20 ft., but the growth curve suggests more than 600 lbs. for a 30-ft. specimen.

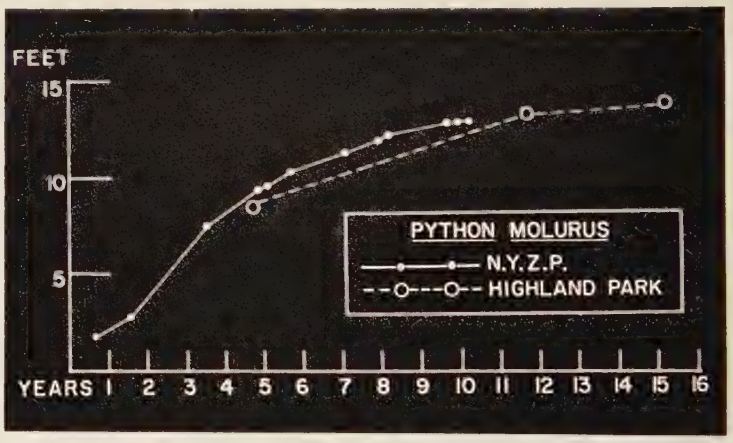
island of Celebes, it is also true that several snakes of about 30-foot lengths have been offered for sale by various animal dealers. Even allowing for the shrinkage caused by applying a tape-measure to such snakes, there is no question that this species attains a length in the upper twenties with fair regularity and a 33-foot snake does not seem impossible.

Furthermore, the Pittsburgh Zoo now has a specimen that was 28½ feet long in 1956 and was still growing at a rate of about 10 inches a year. Named "Colossus," this snake would seem to be the longest snake in any zoological park, by a considerable degree.

Always lingering in the background to offset absolute acceptance of the Reticulated Python as the largest of snakes have been the many tales of the huge Anacondas (*Eunectes murina*) that lie in the vast swamplands of South America. An Anaconda 20 feet long is an unusual individual to be displayed in a zoological park and yet everyone who has lived for long in the South American jungles is convinced that these snakes do grow to sizes that are not even suggested by those few individuals that are captured and sent back to civilization. South American herpetologists are convinced, almost to a man, that Anacondas attain a length that is nearer 40 than 20 feet. And of course we do have the report by the late Emmett Dunn's good friend, an engineer, who with his own steel tape measured an Anaconda killed in Colombia — the measurement: 37½ feet.

We must admit, too, that the South American swampy jungles are much less well-known than the heavily populated Far East. Also, when we estimate the weight of even a 30-foot Anaconda on the basis of the weight/length relationships of smaller specimens, we find that such a snake would probably weigh over 600 pounds! On this basis a 40-feet Anaconda would weigh more than 1000 pounds — small wonder that no such specimens have been brought back by foot-weary explorers. It seems likely that no really large Anacondas will ever reach civilization. As high-powered rifles filter farther and farther back into wilderness areas, "big game" of all kinds disappears. It takes many years for a snake to get 30 feet long, even if we allow a growth rate of a foot a year over-all, and most such snakes, frankly, now will just not get the chance.

There are at least three other members of the family Boidae that at least occasionally attain a

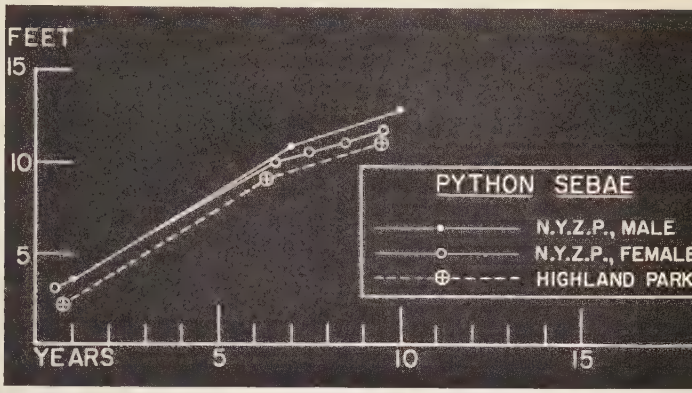


Above — Our Indian Rock Python was hatched in the collection in 1951, so we have accurate figures on its growth. At the age of 10 years, it is just a fraction less than 13 ft. long. Right — A plot of the growth of Indian Rock Pythons in the New York and Pittsburgh Zoos shows approximately identical growth curves.

length of at least 20 feet, though no one has claimed as much as 30 feet for any of them. These are the Indian Rock Python (*Python molurus*), the African Rock Python (*Python sebae*) and the Amethystine Python (*Python amethystinus*) of Australia and the East Indies. The latter snake is quite rare and little is known of its habits but the other two are often found in collections and a considerable amount of information has accumulated on their rate of growth, at least in their early years.

Perhaps the best information is on the Indian Rock Python. One of our present specimens was hatched here in 1951 and it has been measured almost annually ever since. It shows quite a rapid rate of growth for the first six or seven years, to a length of about 10 feet, and then a reduced rate since that time. Our other specimens corroborate this picture. Furthermore, if we assume that the Highland Park snake that was reported on had had a roughly similar growth up to the time it was first measured at a length of slightly under nine feet, an almost identical growth curve is obtained for the succeeding years. These studies also show that it would take a very long time for a snake of this species to attain a

Left — This female African Rock Python in the Bronx Zoo is now 11 ft. 8 in. long. Right — The female in our collection fasted for about half of each of three years and so did not grow steadily after she reached a mature age.



length of 20 feet. Extrapolation of the growth rate at 10 years indicates an age of 34 years for a 17-foot Indian Rock Python. Probably some one has kept this species for this many years, but I can find no records of as much as 20 years — and no growth information for these.

Both the Highland Park Zoo and our own Zoological Park have kept African Pythons for about 10 years. In each case the snake was two to three and a half feet long when it arrived, indicating that it was a year old or less. Our two snakes were later identified as male and female and although their growth rates were almost identical for the first six or seven years, the male forged ahead of the female after that time. The reason for this was easily determined. After reaching maturity the snakes mated and the female deposited a clutch of eggs in each of three years. Since she refused all food from the time of mating until her presence was no longer required to guard the eggs, this meant a fasting period of up to six months in each of these years. The male continued to eat regularly during these periods and surpassed the female in length and to an even greater extent in weight.

If the growth curve of the male between seven and ten years is continued, it can be seen that he would attain a length of 20 feet in about 20 years. In the same fashion, the female would attain this length in about 25 years. However, it may well be that the growth rate is further reduced with increasing age and that both of these figures are too low. Only additional observations can give us the information necessary to clarify this point.

In any case, in these days when snake longevity has become an expected circumstance among reptile keepers, it is a pleasure to be able to report some of the information that is derived from the long-term maintenance of these interesting animals. Much of the information obtained in zoological parks could not be found in any fashion other than the day-to-day observations of the devoted and interested people who care for them. Much more needs to be known but as long as the observations are made and recorded, I am sure that the ancient cooperative spirit of the various zoological parks will ultimately allow it to be synthesized into a comprehensive picture of the habits and natural history of reptile life.

ZOO NEWS IN PICTURES

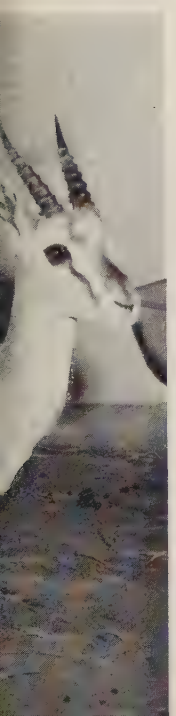
Photographs by SAM DUNTON

Early naturalists writing about the Tasmanian Swamp Hen remark on its extreme shyness and the fact that it can vanish "in the most extraordinary manner" when its suspicions are aroused. We now have two of the birds – our first, a gift of the Basel Zoological Garden – and they are running true to form; they *are* extremely shy. Perhaps they will become less wary later; at any rate, this is the only picture our photographer was able to get in the large area of the outdoor Flying Cage.

For the first time we are exhibiting the Small Malay Chevrotain (*Tragulus javanicus*). We have a pair, happily living in a compartment in the Small Mammal House. They are wary dwellers of the forest, stand 11 inches high.

Planted to give an impression of the tropical forest of Amazonia, the old Komodo Monitor compartment in the Reptile House has been transformed as a home for turtles and iguanas of various kinds. They are thriving in the tropical heat and humidity and several other reptile species will soon be added.

Two years old – a birthday portrait of our young Okapi, born here on October 17, 1959. "Nejoma" (the name is taken from the names of the three men who attended the birth: Neal, Joe and Matty) has only one fault; he is too gentle and trusting, and was constantly accepting handouts of food from the public until a special barrier was put up.



Thompson's Gazelles, generally known as "Tommies," are familiar enough on the plains of Africa but have never before been seen in our collection. Now we have 8 (6 of them shown here) and sometime during the winter they will be put on exhibition in the Antelope House.

"Like Corn in a Popper"--

WOOD DUCKS LEAVING THE NEST

By PAUL A. STEWART

Patuxent Wildlife Research Center

Of the various authors writing before 1924 about young Wood Ducks leaving their nests, most reported that the ducklings were carried by the mother duck from the nest to the water or ground. Except when quoting earlier authors, observers writing since 1924 have reported that the ducklings jumped from their nests to the water or ground beneath the nest. Since it is unlikely that Wood Ducks changed their habits just 37 years ago, the question naturally arises whether earlier naturalists constructed their explanations from poorly made observations, around the assumption that the ducklings could not possibly get safely to the ground without being carried from their sometimes lofty tree nests.

In natural situations Wood Ducks make their nests chiefly in tree cavities formed by decay or excavated by large woodpeckers. The height of the cavity above ground has no influence on its use by these ducks, and nests are sometimes as much as fifty to sixty feet above ground. The nests are placed in cavities one to eight feet below the entrance. Nests may be directly over water or several miles from the nearest surface water.

Typical of the early accounts is that of Mark Catesby, in 1731, in his *"The Natural History of Carolina, Florida, and the Bahama Islands,"* in which he stated that young Wood Ducks attach themselves to the back of the female and are thus carried from the nest to water. In his *"Life Histories of North American Waterfowl"* published in 1923, A. C. Bent cited similar behavior reported independently by two observers. In one observation the ducklings were transported on the back of the female from the nest to the water 28 feet below the nest. The duck's behavior was described as follows: "She emerged from the cavity in the stub with a young duck on her back and simply dropped straight down into the water, using her wings to check the speed of her descent. When she arrived within a foot or two of the surface she suddenly assumed a vertical position which caused the duckling to slide from her back into the water. She rose quickly, circled a time or two, re-entered the stub, and at once repeated the performance until the whole brood of ten were on the water."

In *The Auk* in 1917 E. G. Kingsford reported having observed a duck make eleven or twelve trips from her nest fifty to sixty feet up in a tree to a water area 200 feet from the base of the tree, and each time she carried a duckling by the neck in her beak. Also in *The Auk* in 1924 Henry Mousley reported an observation of a Wood Duck carrying her young in her beak from a tree nest to the ground below. This observation was not made by the author publishing it but was reported to him by an observer thought to have been reliable.

In his *"American Ornithology"* published in 1824, Alexander Wilson also reported the observation of a female carrying thirteen young, one by one, from a nest to the ground at the base of the tree containing the nest. The observation was reported to Wilson rather than having been personally made by him. It was not stated whether the ducklings were carried on the back or in the beak of the female. After the ducklings were all safely transported to the ground, they were led in a group to water.

A. C. Bent suspected the young of being transported by the female duck only when necessary. He stated, "If the nest cavity is not too high, or

A Wood Duck drake in full flight. What is the truth about reports — by so many naturalists of an earlier day — that the female carries ducklings down to the ground from the lofty nest?
Illinois Natural History Survey Photo

if it overhangs the water, or if there is soft open ground below it, I believe that the young are usually coaxed or urged to jump or flutter down and are then led by the old bird to the nearest water." Although Audubon and Bent reported full observations of young Wood Ducks only being carried from their nests to water, these authors suspected that the ducklings may sometimes walk to water after first jumping or fluttering to the ground from their tree nests.

In an article published in *The Condor* in 1924 Joseph Dixon reported having actually observed three broods of young Wood Ducks jumping from their nests to the ground. A list of the persons having made similar observations since 1924 would also be a complete list of persons who have worked with nesting Wood Ducks in that period. In recent years, as far as I know, no one has reported having seen a young Wood Duck transported by the mother duck from the nest to the ground or to water. I have personally watched seven broods leaving their nests, and all of the ducklings in these broods jumped or fell to the ground or water beneath the nests.

The female leads the ducklings from the nest the day after hatching. Audubon stated that they leave the nest the moment they are hatched, but this is not literally true. Departure from the nest usually takes place in the forenoon, but it may be as late as mid-afternoon, depending on hatching time, disturbance at the nest, and weather. The broods leave the nests earlier on warm sunny days than on cool rainy days.

Before the female leads her brood from the nest, she appears from within at the entrance of the nesting cavity where she pauses, seemingly looking around, for several minutes. If no apparent disturbance is present she soon drops to the ground or, in the case of higher nests, to a tree limb below the nest. There she gives a weak *kuck, kuck, kuck* call, and this acts as a "follow me" call to the ducklings.

In response to this call of the female, the

It is often reported that Wood Ducks fly into their nesting cavities at full speed. This photograph indicates a different approach; here the female Wood Duck is clinging briefly to the exterior of the nest.

Photo by W. J. Breckenridge, Minnesota Museum of Natural History

ducklings in the nest start jumping, like corn in a popper, sometimes merely jumping into the air rather than toward the side of the cavity. With their sharp toenails they succeed in clinging to the rough side of the cavity in some jumps. The first jump puts them about eight inches from the floor of the cavity. A second hitch, in which the opposite foot becomes attached, puts them about four inches higher; thus the ascent continues until the cavity opening is reached.

If the side of the cavity lacks a rough surface, the ducklings are unable to escape, and the cavity then becomes a death trap for them. If, in any of the hitches up the side of the cavity, the ducklings fail to keep their heads above them, they usually drop back to the floor of the cavity and must begin the ascent anew. The bill is not used for support in the ascent but is kept pointed almost vertical, the sharp toenails alone being used for clinging to the side of the cavity. While young Wood Ducks' toenails are very sharp, they do not appear to be sharper than those of other ducklings not using their toenails in climbing from cavity nests. In an effort to test this point, I found I was unable to separate fresh skins of ducklings of the Shoveller and the Wood Duck by examining in a darkened room only the points of the toenails. The Shoveller builds its nest among ground vegetation.

All of the Wood Ducklings in the brood leave the nest in close succession, and usually all are out of the cavity in less than two minutes. Depending on the depth of the cavity and the difficulty of the climb caused by smooth spots inside the cavity, the departure of a brood sometimes takes as much as ten minutes.

After having made the climb to the cavity opening, the ducklings jump to the ground or water. In the descent, they maintain a feet-down position and beat their small wings ineffectively. The ducklings' rate of descent is somewhat less than a stone, as when a stone and a duckling study skin were several times dropped to the ground at the same time from a height of 30 feet, the stone had already reached the ground when the skin was still eight to ten feet above. The ducklings are fluffy and light, weighing less than an ounce, and weigh only 3.2 grams per square inch of surface exposed to resistance against the air when they are falling.

Before leaving the nest, the female surveys the surroundings for some time, to make sure all is quiet. Then she drops to the ground and issues her summons and ducklings jump "like corn in a popper."

Illinois Natural History Survey Photo

Although the ducklings sometimes land on hard ground or bare rock, the impact appears not to harm them. I dropped five day-old ducklings from a height of 20 feet onto a hard limestone drive, and after a moment of delay they all ran from the spot where they fell. One duckling started running with a wobbly gait, suggesting that it had been slightly dazed by the impact, but it soon showed no further signs of injury. They all landed on their feet or bellies.

These five ducklings all voided excrement soon after striking the ground. Several other ducklings were also observed to have voided excrement after jumping onto water from a nesting cavity only five feet above the surface of the water.

Modern observers differ on the extent to which the ducklings bounce on striking the ground, reported bounces varying from zero to several feet. This disagreement doubtless stems from differences in the nature of the ducklings' landing places. I have seen ducklings jump onto hard bare ground and onto loose bare soil, and in both cases they bounced little or none. Several observers have reported that the ducklings bounce several inches when jumping onto grass on a lawn.

The ducklings gather in a compact group soon after they arrive on the ground or water beneath the nest. There they wait with the female until all members of the brood have had an opportunity to clamber out of the nesting cavity. As they follow the female from the nesting site, the ducklings usually remain in a compact group, but they sometimes string out in a line.

Sometimes one or several later hatched and weaker ducklings, unable to climb up the side of the cavity, are left behind in the nest. Some of these remain to die, and some later escape from the nesting cavity either to become lost or eventually to join their own or another brood.

The ducklings are left exposed on open water only a short period immediately after leaving the nest, and if the nest is located so that the ducklings jump directly into water, the female soon leads her brood into hiding cover. If the nest is located over water with no protective vegetative cover nearby, the brood is led to the nearest area offering the combination of water and vegetative cover. If the birds are on a stream, or on a pond with a stream leading from its lower end, they follow the course of the stream. In several known

Right — No, this photograph h not been accidentally turned its side! It shows a baby Woo Duck just launching itself in the air after scrambling out t the nest hole. Its tiny and all b ineffective wings are in motio

Illinois Natural History Survey Photo

An even more dramatic photo of a Wood Duckling launching itself in response to its mother's calls from the ground. A nest may be 50 ft. above the ground.

Photo by W. J. Breckenridge, Minnesota Museum of Natural History

cases, movement was downstream rather than upstream, and this was probably because a larger creek associated with vegetative cover lay in that direction.

If the nest is located over land, the trek toward water is immediately started. The family probably takes the shortest course toward water but direct evidence on this point is difficult to get. This overland trek often results in Wood Duck families being seen in strange places. Nearly every small town newspaper within this bird's nesting range has at some time carried a report of a brood of ducklings having been observed on the town streets, sidewalks or lawns. The family's conspicuousness when leaving the nest and the time of day when this occurs often result in the discovery of nests near human dwellings where they had not been previously suspected.

In leading the brood, the female continues to use her *kuck, kuck, kuck* call, and the ducklings respond by giving a peeping call and by following her. These calls of the female and of the young are relatively weak and cannot be heard when the birds are too far separated.

On a somewhat windy day in May, 1956, I observed a brood of ducklings leaving their nest. After coming out of the nesting cavity the female alighted on a pond at a position of about 10 feet from directly beneath the nest where five ducklings promptly joined her. The female and the five ducklings then moved about 15 feet farther from the nest where they were separated by a steep bank from the remaining five later-coming ducklings. The wind was blowing in a direction

from the ducklings toward the waiting female. The second five ducklings huddled together near where they fell and continued to fail to move toward the waiting female. The fact that the female continued to wait suggested that she heard the calls of the lost ducklings; whereas the failure of the ducklings to join the female suggested that the ducklings did not hear her calls. Presumably the direction of the wind imposed sufficient disadvantage on the ducklings that they could not hear the female although they were heard by her. After waiting some 15 minutes I captured the five ducklings and tossed them toward the female on the water. They promptly joined the other members of their family and disappeared among the nearby vegetation.

A. C. Bent quoted a correspondent who credited the Wood Duck with an ability to count. The correspondent stated, "It was plain that she could count enough to know if one was missing." It is doubtful that this statement is true, and certainly mother Wood Ducks lose many of their ducklings when enroute to water. In Burlington, Iowa, Frederic Leopold observed a loss of 61 from 189 ducklings which moved down a steep bluff and about one city block toward water.

In their early days out of the nest the ducklings have a strong tendency to follow any moving object. During most of the time in the first few days out of the nest the mother duck and other members of the brood are the chief moving objects in the presence of the ducklings, and they thus keep together. However, the ducklings sometimes become separated from the mother and other members of their brood; then they readily follow objects in addition to other members of their family. Twice lost ducklings have followed my boat which was being slowly propelled with an outboard motor. In Wood Duck habitat, where other broods of the same species may be present, this following reaction often results in lost ducklings joining broods other than their own. Because of the presence and movements of other ducklings, a duckling lost on water has a much better chance of finding others of the same species than a duckling lost on land some distance from water.

Despite the circumstantial accounts of earlier naturalists — and despite the danger of saying that animals *never* do certain things credited to them — the fact remains that field naturalists nowadays have made plenty of observations of young Wood Ducks jumping from the nest, and none of them being carried down.

THE FAMILY LIFE OF THE MULGARA

By DAVID FLEAY

Fauna Reserve, West Burleigh, Queensland

THE SAND HILLS and salt-bush flats of Central Australia are forbidding country; dry, sun-baked, inhospitable to man. Yet certain four-footed creatures thrive there and it is always a special thrill to an "animal man" when he has the chance to observe any of these at close quarters in the more convenient surroundings of his own zoological collection. I have been able to do that with one of the most charming of Central Australia's specialized animals, a crest-tailed marsupial which the aborigines called the Mulgara, and which scientists term *Dasycercus cristicauda*. It is sometimes called the Crest-tailed Pouched Mouse, too, but it isn't a mouse; it merely looks somewhat like an out-sized creature of that kind and is not a rodent.

It is not too easy to get small pouched animals out of the interior of Australia, and we at the Fauna Reserve were delighted in 1955 when Dr. Peter Morrison, now professor of zoology at the University of Wisconsin, presented us with a pair of Mulgaras when he returned home after studying the metabolism of marsupials in Australia. These little rarities had been dug out of a sandbank at Haasts Bluff in Central Australia in December of 1954.

Bright-eyed, fawn-colored, active, they were delightful and entirely satisfactory exhibits. Not only were they active in daytime, but they were inquisitive about everything new and they had a lizard-like fondness for basking flat out in the sun for long periods – a perfect trait in an animal that we wanted to study closely. In the beginning they were not in very good condition and their coats were poor, as a result of too-prolonged feeding on beef, but plenty of insect food, mice, egg custard and the like soon brought them into condition. They proved to be quite gentle, too – not biting readily, and uttering only the merest heavy breathing or shushing sounds in the way of mild protest when handled. But on real provocation they could bite – and severely.

The male (and subsequent male offspring) averaged 4½ ounces (127.8 grams) in weight and the female was 3¼ ounces (92.3 grams). Since the common mouse weighs less than half an ounce, it can be seen that the Mulgara is comparatively big game.

The bodies of our pair were clothed in sleek, soft, brownish-fawn hair. The thickened "carrot" tails were especially interesting. The basal portion was covered with bright rufous fur, the terminal half with an arrow-shaft arrangement of comparatively large dorsal and smaller ventral hairs in shining black erectile crests. Perhaps it is by means of this tail structure that, in a sandy environment, the Mulgara's leaps upon its prospective victims are rendered more accurate.

Though comparatively well-mannered toward one another, when the Mulgaras were hungry they were tireless and deadly hunters of insects and lizards and the common mouse. Once a mouse was scented, it was relentlessly tracked down. Instantly the Mulgara would point rigidly, frozen in its tracks, its tail quivering lizard-fashion. Then in a flash it would leap upon its prey and bite across the nape of the neck, rolling and kicking simultaneously with both hind feet. All would be over in a few seconds, but before commencing to feed the little hunter cleaned itself, licking its fur to get rid of the clinging odor of mouse. All the time it would squat near its prey, uttering churring undertones of warning against possible robbery.

It was especially interesting to see that the Mulgaras methodically skinned their prey; starting at the tip of the nose, they usually separated the skin and rolled it back as the body was de-

A typical stance of the Mulgara, with one forefoot raised and folded against the body. The eyes are large and bright and give the Mulgara's face an air of keen enquiry. Its fur varies from buff to brown.
Photo by the Author

voured from head to tail. Often, at the end, the skin was removed and discarded, inside out, without any lacerations.

Strangely enough, although Mulgaras may kill mice or lizards or small birds in a lightning rush, our pair and their descendants were seen to exercise rather comical caution in dealing with grubs, beetles and spiders. They repeatedly shy off such food items and are likely to use their hands in repeated scrabbling actions to confuse and weaken the victim before it is picked up and noisily crunched. This caution may be related to the pugnacity and ready retaliation offered by desert spiders and scorpions.

Like many other marsupials, Mulgaras on occasion go through a convulsive regurgitation of their stomach contents some time after a meal and then reswallow without further chewing.

The family life of Mulgaras had never been recorded, and naturally we were keen to find out what we could. They were seen mating on July 1, 1955, and not long afterward we removed the male — for we have learned by sad experience that males of the Family Dasyuridae are highly irresponsible and never to be trusted in the vicinity of tender, new-born young.

However, despite our precautions, not a single joey appeared. Possibly the Mulgaras were not yet fully back in condition, or it may be that our handling of the female to inspect her pouch area upset the chances for success.

Oestrus occurred again (as in so many of the Dasyuridae) almost exactly a year later. Mating in 1956 took place initially on June 23 and persisted for 24 hours. Because of captive conditions, there was no means of escape for the now torpid and frayed-looking female and the male was removed on the evening of June 24.

The female thereupon set about building a large and comfortable nest, consisting of bark and leaves which she collected in her mouth from all over the cage. A pouch, as such, did not exist, but its location — normally almost indistinguish-

able from the abdominal fur – now became differentiated by the outward growth of long, tufted, white hairs marking a shallow ridge on each side of the mammary area.

On or about July 21 the female began to keep to her nest most of the time and we judged that it was then that the joeys crawled to the teats. This would indicate a gestation period of about 30 days.

Having had some unfortunate experience with other marsupials, I dared not handle the Mulgara to make sure that she was carrying her babies. However, confirmation came 14 days later when she ran up the netting at the front of her cage to seize a grasshopper. Tiny, very pink, blobs that were almost hidden in the specially developed white hairs made it certain that she had babies, although we could not yet make out just how many.

Week by week the pink cluster became more pronounced and at the age of five to six weeks we could estimate that the joeys, in curled posture, measured ⅜ of an inch, and that there were six of them. Earlier naturalists had mentioned a maximum of seven in wild-caught Mulgaras, and the number of teats varies from six to eight.

Quite bulky by now, the babies were tightly packed and motionless as their severely handicapped mother moved about. Throughout this period of "permanent" attachment the female stepped high, with arched back and raised tail, to avoid dragging the babies more than could be helped. At this time in particular she was seen to regurgitate food into her mouth and to reswallow it, as in the "cud-chewing" of kangaroos.

On the morning of what was approximately the 58th day (September 16) we saw the female Mulgara frisking through the sunlight, obviously carefree and unhampered. When she sat on a log to go through a methodical toilet of licking and cleaning, we saw that her "pouch" was so empty that it was distinguishable only as a pinkish patch. All her babies had been left behind, in the nest.

The mother seized upon this wonderful opportunity to carry mouthfuls of fresh dry grass into the nest. However, the fact that her family (later determined to be four males and two females) was no longer carried (or should I say dragged?) around, did not mean that they stayed put indefinitely. For some weeks yet they were attached as often as not when she sallied forth. Now they were covered in light gray coats of fur.

Carefree moments while the babies were at home uttering sibilant cries of *cha-cha* often found the mother bolstering up the nest with fresh material or sitting up to wash her pouch, face and flanks. At other times she would lie spread-eagled, eyes shut, in uninterrupted hot sunlight. She seemed to delight in the really intense heat; on the other hand, at night on the desert the temperature drops quite low and the vitality of Mulgaras falls accordingly. On frosty mornings they were often torpid.

The babies' eyes opened at 10½ weeks. They were "bull-headed," furred in yellowish-brown as far as mid-back but more thinly haired further back. The typical fat tails were black-tinted at the end. Now they had become fairly active but

It is easy to understand how handicapped a fem Mulgara would be when all six of her babies cli to her. Here only four of the litter have climb aboard. (One is upside down under its mothe

Photo by the Author

if they were disengaged from their mother for the merest fraction of time they called *chup-chup!* in frantic anxiety until they were able to hook onto her comforting warmth once more. Then she was indeed severely handicapped, for each of the six babies measured some 3¾ inches in length.

Now, as for some time earlier, it was important for her to hunt without the handicap of six dangling weights, and it was diverting to see how she shed her brood. Suddenly she would start a rapid shaking or vibration of her abdominal area so that one by one the babies let go and bunched up with brothers and sisters in the nest.

By late October, at the age of 12½ weeks, the black-tailed offspring began making short and furtive expeditions on their own. But encounters with beetles and grubs always alarmed them and usually ended in frantic sprints for home and mother.

There is a definite play stage in the development of baby Mulgaras when they stalk one another and make simulated ferocious attacks. Like their parents, however, they were not particularly vocal, even in play.

With the coming of November the babies at-

tained the age of 3½ months and to all intents and purposes they were sub-adults, three-quarters grown and independent. Moving most actively in early morning sunlight, they were on the prowl also in late afternoon and at night. We gave them a large, concrete-floored run with hollow logs, grass tussocks and burrowing space, and they did very well indeed and were fascinating exhibits to our visitors, not only because of their good looks and fearlessness but because of their habit (unusual for a marsupial) of skipping about by day. It is a measure of their fearlessness that they often sniffed noses with visiting dogs, through the wire netting of the run. They were not good climbers but nevertheless they could run easily up logs or the wire netting in pursuit of grasshoppers. Unfortunately, small skinks were in the habit of entering their quarters, and inevitably the Mulgaras caught and ate many of them. These lizards are infested with nematode worms and in the ensuing years several members of the Mulgara family died from their effects, in extremely poor condition.

However, there was a further breeding event in which four joeys attained adult status in 1958 and the family is still represented in our collection in 1961.

It is interesting that this delightful desert mammal is the one that Wood Jones reports (in "Mammals of South Australia," Part I) to multiply in astonishing numbers during the passage of mouse plagues across Central Australia. He believes that the Mulgaras are of great value in reducing the numbers of the mice.

Since "pouch" development and mating in our animals in 1955, 1956, 1957 and 1958 occurred only once in the twelve months, and in each year fell within the five-week period beginning in the last week of June, I have wondered whether the multiplication of Mulgaras during mouse plagues (which guarantees plentiful food) was not due to successful development of full pouch loads in the winter seasons rather than an acceleration of the breeding cycle. In very hard times it is doubtful whether Mulgaras would breed at all, and in any case scarcity of food would automatically reduce the chances of survival of *all* the offspring. But those are speculative matters; what is certain is that we have thoroughly enjoyed following the family life of a delightful personality animal.

BEHIND THE SCENES

NEWS AND NOTES OF THE ZOOLOGICAL PARK, THE AQUARIUM AND THE DEPARTMENT OF TROPICAL RESEARCH

Navy Scientists Will Work In New Filtration Plant

One of the show-places of the Aquarium at Coney Island is actually a part of its mechanism – the new filtration plant adjoining the Oceanic Pool. An area below decks will be open to special visitors interested in the mechanics of filtration, and a laboratory has been set aside in the plant for use by Navy scientists to test anti-fouling agents. These will be tested on organisms such as barnacles, tube-worms and bryozoans.

Specialist's Care Give to Aquarium's Baby Walrus

One of the three baby Walruses that Dr. Carleton Ray brought to the Aquarium from Alaska last May was stricken with acute trachial bronchitis on October 21. Without the slightest warning, Aivok became seriously ill about 9 o'clock in the morning and thirteen hours later he was dead. Aivok spent most of the day in an oxygen tent under the constant care of Dr. William Antopol from New York's Beth Israel Hospital and Dr. Ray, but he did not respond to the antibiotics and other treatment given him. Hospital laboratory tests revealed that the organism responsible for his death could be controlled with Chloromycetin, and doses of this antibiotic were immediately given to Seeku and Tipuk, the other Walrus babies.

This prompt preventive medication was apparently successful, for the other two Walruses showed no signs of illness, despite their close contact with Aivok. At the time of his death, Aivok weighed more than 300 pounds and had been gaining steadily in weight. Seeku and Tipuk have continued their rapid growth; they now weigh 366 and 322 pounds, respectively, which represents gains of 221 and 202 pounds since their arrival less than six months ago. J.W.A.

IN BRIEF

Animal Nursery. A contract to erect the basic building of the Animal Nursery in the Children's Zoo was let in September and rapid progress is being made towards its completion. It will be opened in the spring, at the time of the opening of the Children's Zoo – the Saturday before Easter.

Injection Gun Use. Development in recent years of injection guns that shoot a syringe loaded with tranquillizers or medicaments of one kind or another has made immeasureably easier the task of the Zoo's Veterinarian. An example was the case this fall of the bull Roosevelt Elk in our collection. Possessed of a magnificent rack of antlers, he dominated the herd unmercifully and finally gored two cows seriously. Before the injection gun came along, it would have been necessary to hold him in an isolation pen for weeks – and the job of treating the injured cows would have been almost impossible. However, Dr. Gandal used the injection apparatus so successfully that the bull was immobilized and his antlers removed; the two cows were also brought down long enough for their wounds to be treated. One subsequently died from the severity of its injuries; in the old days, both might have.

Teachers' Course. The fall session of the In-Service Teachers' Course is again holding weekly sessions in the Zoological Park – the 24th course given by the staff to public school teachers of the city to acquaint them with the facilities of the Zoological Park. This fall 31 teachers are registered for the course, and 1,080 have taken the course since it was established twelve years ago. It is under the general direction of Mr. Knobloch of the Education Department.

Color in Birds. The loss of red, yellow and

orange in a substantial percentage of our small bird collection, particularly in the toucans and cock-of-the-rocks, is a serious problem of which we are made more aware whenever we receive freshly-caught, brightly-colored wild specimens. A section of the Bird Department's quarantine rooms is now being set aside for a series of experiments in the hope of solving the problem. Our successful flamingo diet – now being used by many other zoological parks – seems to be ineffective as an aid in the color metabolism of the small species.

Big Reptile Collection. The Zoological Park's reptile collection is now at an all-time peak with 878 specimens of 290 species.

Growth Inhibitors. For years it has been known that females of a small worm, *Bonellia,* drastically inhibit the growth of *Bonellia* larvae which come in contact with them, but no one had suspected that extracts from females give a similar reaction with other kinds of animals. That this is the case has now been demonstrated by Dr. Ross F. Nigrelli, the Aquarium's pathologist, who has brought back *Bonellia* extract as a result of his European trip this fall.

Fall Closings. The Farm-in-the-Zoo closed for the season on October 15, and the Children's Zoo on November 12.

Rajpur Is No More. Rajpur, our Tiger patriarch, has been ailing for some time and showing various senile infirmities. With the reluctance born of many years of memories, the "old man" was destroyed on October 5. He was born here on February 8, 1944, and in his prime was estimated to have weighed considerably more than 500 pounds. Bred to his litter mate, Dacca, they produced 32 cubs between 1948 and 1959.

Scientific Interests. At the meeting of the American Institute of Biological Sciences at Purdue University, the Aquarium was represented by four papers, three by Dr. Nigrelli and one by Dr. Kallman of the Genetics Laboratory. These dealt with the effects of copper on fish, certain effects of atomic radiation on salamanders, the testing of poisons from sponges by means of sea-urchin eggs and a description of how transplantations can be used to reveal parthenogenesis and other unusual methods of reproduction.

PUBLICATIONS OF INTEREST

A COLOURED KEY TO THE WATERFOWL OF THE WORLD. By Peter Scott. 23 plates in color, many line drawings, 91 pp. Chas. Scribner's Sons, N. Y., 1961. Price $3.50.

First published in 1948-49, with drawings in black-and-white, in the 2nd Annual Report of the Severn Wildfowl Trust, this useful little book appeared in 1957 with illustrations in color. The present edition has been considerably revised, particularly in regard to intervening changes of opinion as to nomenclature and relationships. Peter Scott's well known competence with the brush and his intimate knowledge of waterfowl in life, gained both in the field and as Honorary Director of the Severn Wildfowl Trust, have already firmly established his "Key" as a classic. It is not only definitive but clever, particularly in the division into groups for ready identification under "Size," "Shape," "Colour," "Voice," "Behaviour," etc., ending with what to do "If you are stuck." With this book in hand, the last would seem to be a situation very difficult to achieve. – L. S. C.

UNRESTING CELLS. By R. W. Gerard. 434 pp., many drawings and photographs. Harper Torchbooks. Paperbound. $2.25.

THE EVOLUTION OF HUMAN NATURE. By C. Judson Herrick. 500 pp.; drawings. Harper Torchbooks, New York. Paperbound. $2.45.

Students of biology will welcome these inexpensive, paperbound editions, the first originally published five years ago and the second more than twenty.

THE FERN GUIDE. By Edgar T. Wherry. 318 pp., many drawings by James C. W. Chen. Doubleday & Co., New York. $3.95.

HOW TO KNOW THE FERNS. By Frances Theodora Parsons. 215 pp., many drawings by Marion Satterlee & Alice Josephine Smith. Dover Publications, New York. Paperbound. $1.25.

These two identification-guides serve different audiences; the former is excellent for the serious amateur, the latter for the casual hobbyist.

ALEXANDER WILSON: Naturalist and Pioneer. By Robert Cantwell. 319 pp., 8 color plates, 16 pp. of black-and-white illus., decorations by Robert Ball. Lippincott & Co., Philadelphia, 1961. $15.00.

This is the first modern biography of that unhappy Scottish-American wanderer, Alexander Wilson, author and illustrator of *The American Ornithology,* whose nine volumes appeared between 1808 and 1814. (There is, incidentally, a full set, with Bonaparte's continuation, in the Zoological Society's library). Wilson was one of the pioneering "greats" in American natural history, well-deserving of Mr. Cantwell's prodigious research into his Scottish boyhood and his patient exploring of Wilson's career and associates in America. It is a pity that the high price of the book may keep it out of the hands of many who would find it of the greatest interest.

THE LAND THAT SLEEPS. By G. M. Glaskin. 294 pp.; photographs, maps. Doubleday & Co., New York, 1961. $4.95.

The author and a companion recently made an automobile trip along the coast of Western Australia and down through the Northern Territory. Mostly it is a desperately bleak land – with enormous potentials which the author constantly stresses. The book is fascinating armchair travel today; a generation hence, *if* the area develops as it well may, it will be a valuable source book on the "early days."

DISCOVERY: Great Moments in the Lives of Outstanding Naturalists. Edited by John K. Terres. Wood engravings by Thomas W. Nason. 338 pp. J. B. Lippincott Co., Philadelphia. $6.50.

Thirty-six widely-known naturalists tell the stories of moments or events or discoveries that have illuminated or influenced their lives. Many are well known to readers of *Animal Kingdom:* Peterson, Murie, Eckleberry, Darling, Kieran, Skutch, Chapin, Armstrong, Delacour, Carter. This is an excellent book for a beginning naturalist, to show him the variety of experience that may come his way.

MAN AND DOLPHIN. By John C. Lilly. 312 pp., 49 photos, 3 drawings. Doubleday & Co., Inc., Garden City, N. Y., 1961. $4.95.

A popular idea about animals is that some of them are smarter than man. Up to now, however, no scientist has ever seriously entertained such an idea, mostly because no animal even approaches man in the complexity, variability and adaptability of its behavior; in particular, no animal has developed a culture or can communicate by means of words. Dr. Lilly now challenges this concept of the uniqueness of *Homo sapiens.* On the basis of studies made of the Bottle-nosed Dolphin or Porpoise, Dr. Lilly advances the proposition that these aquatic mammals possess a language with abstract symbols and some sort of culture as well. He also is convinced that it is only a matter of time before we can communicate with them, either by learning "dolphinese" or by teaching them English.

These are truly revolutionary ideas, and if they prove to be correct, Dr. Lilly will take his place next to Darwin as one of the greatest, most creative innovators in Biology.

There is nothing wrong with radical scientific theories or hypotheses; in fact, they may serve to advance knowledge even if they do no more than stimulate new thoughts or clarify old ones. Dr. Lilly cannot be criticised because of the originality of his ideas or the breadth of his imagination. Unfortunately, however, he has chosen to write a popular book, filled with irrelevant personal details, as the way to present his data and conclusions. Its popular format may explain why there is hardly a single observation or interpretation in it that would not be questioned in a court of scientific law. Strong evidence in favor of Dr. Lilly's hypotheses has yet to be brought forward. On the other hand, the public has accepted Lilly's "talking porpoises" with open arms. Scientists and educators who believe that it is important for the members of a democratic society to have a rational view of animal life can only wish that Dr. Lilly had not felt called upon to put himself so prominently in the public eye. — J. W. Atz.

New Members of the New York Zoological Society

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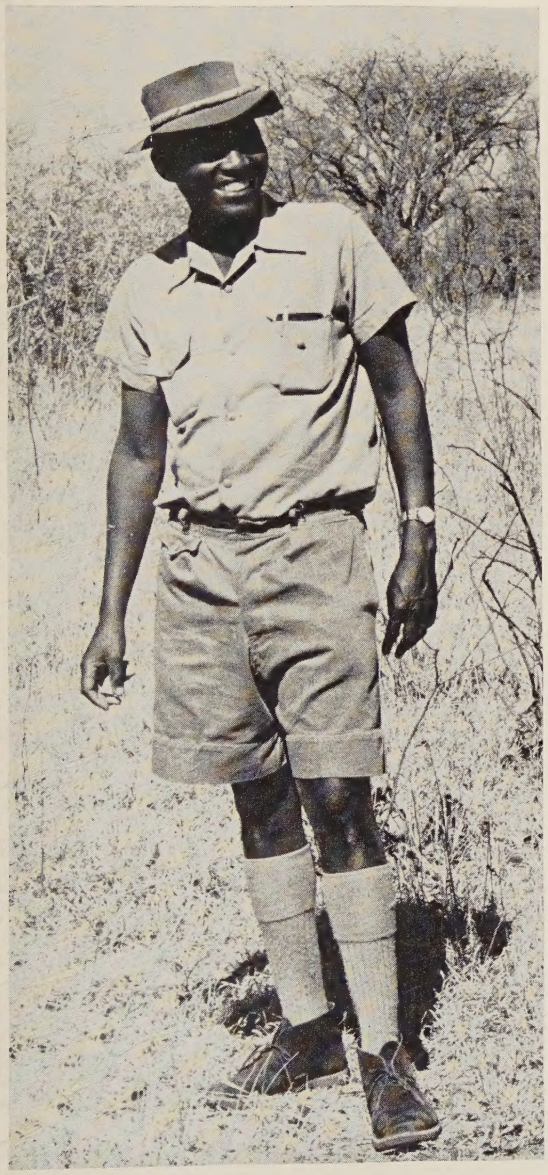
There Will Be More Society Newsletters



Senior Scout Sidney Simpelwe

SENIOR SCOUT SIDNEY SIMPELWE'S recent newsletter from Southern Rhodesia to Members of the Zoological Society is unique. It's the first report on wildlife survival written by an African that we've ever seen and it conveys a picture of native attitudes that only a native could perceive. In the way it brings news directly from the field to Members, Mr. Simpelwe's letter ranks with the great newsletters Members have received since 1947.

Curator of Publications William Bridges started the whole thing by air-mailing on-the-spot reports about Charles Cordier's quest for the Congo Peacock. When Jocelyn Crane went to Tahiti in 1956, she was prevailed upon to write Members about the fiddler crabs in the mudflats of the South Sea Islands. Other notable newsletters followed: William Beebe's description of tropical research in Trinidad; George Treichel's analysis of African parks and wildlife refuges; David Fleay's account of his capture of platypuses for the zoo; William Conway's saga on his expedition to find and bring back James's and Andean Flamingos; and Jim Simon's newsletter of last Spring about the competition between Masai cattle and wildlife for water and grazing land.

If you want a friend to receive the next Society newsletter, please send us the name now. We don't know yet *where* the next letter will originate, but we can predict it will be as topical and fresh as its great predecessors.

NEW YORK ZOOLOGICAL SOCIETY
FOUNDED 1895